Extron® Electronics
INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual

PRELIMINARY

MPX 423 A

Media Presentation Matrix Switcher

68-972-01 **Rev. A**
Printed in the USA
08 04

Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

Quick Start — MPX 423 A

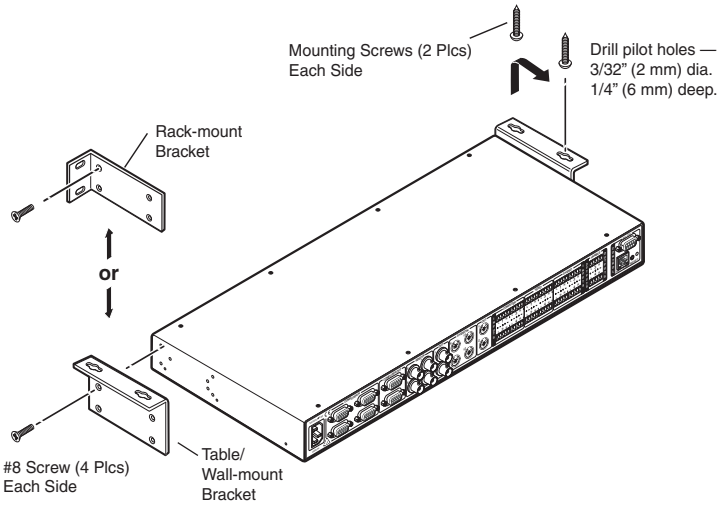
Installation

Step 1

Turn off power to the MPX 423 A switcher and all other devices that will be connected.

Step 2

Select your mounting option and install the appropriate brackets. Mount the switcher as illustrated below (see chapter 2, *Installation* for detailed instructions).



Step 3

Attach up to four VGA, four S-video, and four Video (composite) input devices (up to four of each type) to the MPX 423 A switcher.

Step 4

Connect up to two VGA, two composite video, or two S-video outputs from the switcher to a projector or other output device. See the following page for an installation diagram.

Step 5

For audio input, connect up to 12 audio sources to the audio inputs of the VGA, Video (composite), or S-video groups (up to four audio sources for each group). Refer to Chapter 2, *Installation*, for wiring diagrams.

Step 6

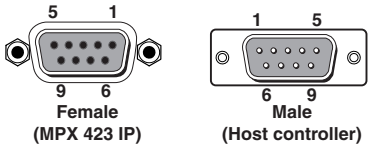
For audio output, connect up to two audio output devices. Refer to Chapter 2, *Installation*, for wiring diagrams.

Step 7

If the MPX 423 A matrix switcher is to be **connected to a computer or host controller for remote control**,

1. Connect the host controller's RS-232 cable to the 9-pin, female RS-232 remote connector of the switcher (see pinout table on the following page).

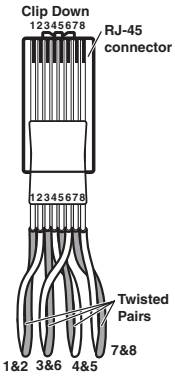
Pin	RS-232	Description
1	—	not used
2	Tx	Transmit data
3	Rx	Receive data
4	—	not used
5	Gnd	Signal ground
6	—	not used
7	—	not used
8	—	not used
9	—	not used



RS-232 remote connector pinout table

And/or

2. Plug one end of a Cat 5, straight-through Ethernet cable to the RJ-45 LAN port of the switcher. See below for pinout instructions.



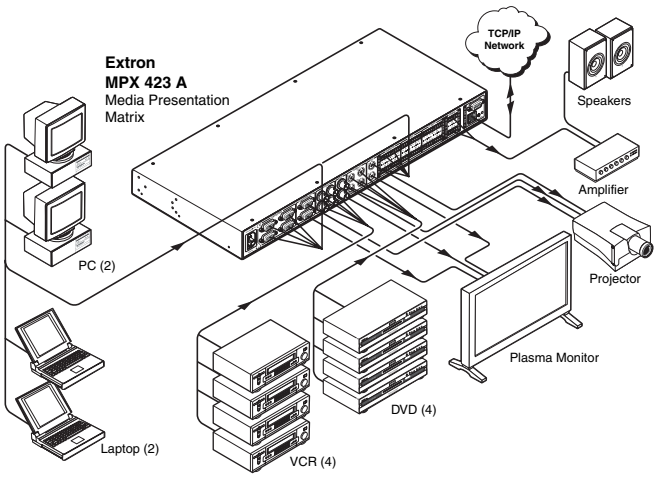
Straight-through cable

Side 1		Side 2	
Pin	Wire color	Pin	Wire color
1	White-orange	1	White-orange
2	Orange	2	Orange
3	White-green	3	White-green
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Green	6	Green
7	White-brown	7	White-brown
8	Brown	8	Brown

For more detailed information, see the *Remote Control Port (RS-232)* section in chapter 5.

Step 8

Power up the input and output devices, then connect power to the rear AC connector of the switcher. For further details, see the appropriate chapters in this manual.



Connecting the MPX 423 A matrix switcher

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This chapter is not available in this preliminary version.

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Chapter 1 One

Introduction

About this Manual

About the MPX 423 A

Features

Introduction

About this Manual

This manual discusses how to install and operate the Extron MPX 423 A Media Presentation Matrix Switcher.

About the MPX 423 A

The Extron MPX 423 A is a media presentation matrix switcher that merges three independent matrix switchers into a single, compact enclosure: a 4x2 VGA switcher, a 4x2 composite video switcher, and a 4x2 S-video switcher. In addition, the MPX 423 A offers a 12x2 stereo audio switcher. The MPX 423 A supports both single and separate switching modes.

Ideal for expanding the input capabilities of a typical LCD or DLP projector, the MPX 423 A provides a second set of outputs for local or preview monitoring, or a second presentation system.

The MPX 423 A has 15-pin HD input connectors for VGA signals, BNC input connectors for composite video signals and 4-pin mini DIN input connectors for S-video signals. Audio uses 5-pole, 3.5 mm captive-screw connectors shared between three input groups, and features balanced and unbalanced wiring.

The user has a choice of three control options:

1. Front panel touch button control
2. RS-232 using a Windows®-based control program (WCP) or SIS commands
4. Ethernet control (using Telnet, WCP, or the on-board Web server)

Features

Multiple video inputs — Twelve inputs including four VGA (or SVGA, UXGA, RGBHV, RGBS, RGsB, or RsGsBs) inputs on 15-pin HD female connectors, four S-video (NTSC, PAL, or SECAM) inputs on 4-pin mini DIN female connectors, and four composite video (NTSC, PAL, or SECAM) inputs on BNC female connectors.

Multiple video outputs — Two outputs per video format for simultaneous (in Separate mode), or one at a time (in Single mode) display on VGA, composite video, or S-video devices.

Audio switcher — The 12x2 audio switcher selects among the audio outputs of each of the three signal groups.

Audio breakaway — The MPX 423 A provides the capability to break away an audio signal from its corresponding video signal. Audio breakaway switching can be done via the front panel, Ethernet, or RS-232.

Multiple audio inputs and outputs — Twelve balanced/unbalanced stereo inputs and two balanced/unbalanced stereo outputs, all using 3.5 mm, 5-pole captive screw connectors.

Single Switcher mode — Allows for one-touch switching. When one of the 12 inputs is accessed, the signals of the input will be routed to the outputs of its group. Outputs of the other groups are disconnected, while audio output remains unaffected.

Separate Switcher mode — Allows for independent switching to the output of any given I/O group. This effectively divides the MPX 423 A into three separate switchers in one box.

Current configuration memory — Allows for ties and audio settings to be saved in nonvolatile memory. When the switcher is powered off and then on again, the switcher recalls the connections made on the last configuration, including audio settings.

IP Link™ — IP Link-enabled products offer an integrated Web server with high performance architecture, global compatibility with industry standard Ethernet communication protocols, multi-user support, and a Web-based asset management application specifically designed to work with products that include IP Link technology.

RS-232 remote control — Allows remote control of the MPX switcher using Extron's Simple Instruction Set SIS™), Extron's control software for Windows®, or a third-party control system.

Downloadable firmware updates — The latest firmware can be conveniently downloaded from the Extron Web site, and updates for new features and capabilities can be easily upgraded through the RS-232 or the IP Link Ethernet port.

Bandwidth — Bandwidth is 350 MHz (-3 dB), typical for VGA video, allowing this switcher to switch everything from NTSC video to high-resolution computer displays.

Front panel security lockout — Locks out all front panel functions except for input/output tie viewing to prevent unwanted setting changes.

Genlock Sync (for composite and S-video) — Includes video genlock capabilities allowing for vertical interval switching and smooth, glitch-free transitions.

Digital Sync Validation Processing (DSVP™) — Includes Extron's exclusive DSVP, which allows for the monitoring of input signal status information, as well as the scan rate for computer signal inputs.

Input audio gain and attenuation (adjustable via RS-232) — Allows users to set the level of audio gain or attenuation (-18 dB to +24 dB). Individual input audio levels may be adjusted so there are no noticeable volume differences when switching between sources.

Speed-sensitive volume control — Automatic sensitivity control allows the user to easily fine-tune the audio volume.

Versatile mounting options — The MPX 423 A is housed in a rugged, 1U, full rack width metal enclosure, and can be easily mounted into any rack or podium, or under a desk.

Internal international power supply — The autoswitchable, internal power supply provides worldwide power compatibility.

Chapter Two

Installation

Mounting the Matrix Switcher

Rear Panel Connectors

Connecting the MPX 423 A Matrix Switcher

RS-232 and Ethernet Control

Mounting the Matrix Switcher

The MPX 423 A is housed in 1U high, 17.4" wide metal enclosures that are rack- or desk-mountable. The appropriate rack/desk mounting kit (**#70-077-03**) is included with the switchers. The switchers may also be surface-mounted under a table, desk, or podium, or on a wall, using an optional Extron 1U enclosure under-desk mounting kit (**#70-222-01**).

Tabletop use

For tabletop use, affix a self-adhesive rubber foot to each corner of the bottom of the switcher.

Rack mounting the switcher

Rack mount the switcher as follows:

1. If feet were previously installed on the bottom of the switcher, remove them.
2. Attach the rack mount brackets to the switcher with the eight #8 machine screws provided (figure 2-1).

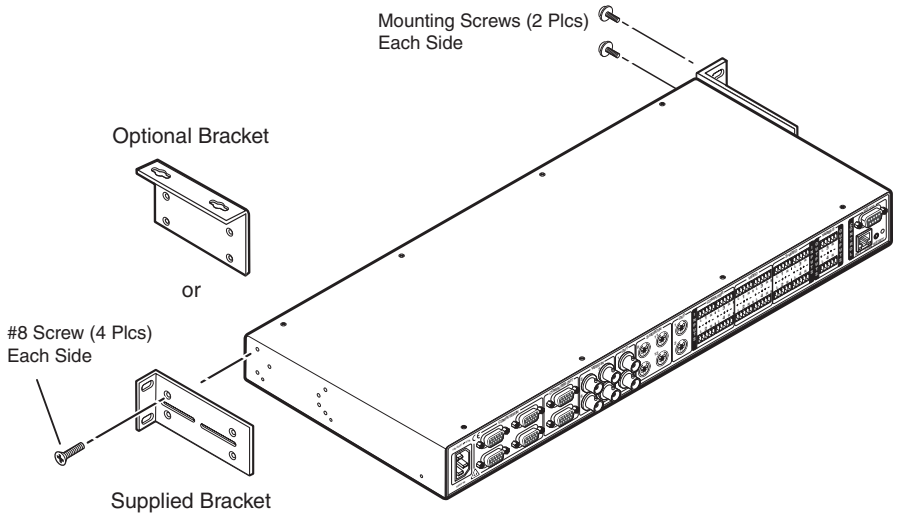


Figure 2-1 — Mounting the switcher

3. Insert the switcher into the rack, align the holes in the mounting bracket with those of the rack.
4. Secure the switcher to the rack using the supplied machine screws.

Furniture mounting the switcher

The MPX 423 A can be mounted under a table or other horizontal surface with an optional Extron under-desk mounting kit (part **#70-222-01**).

1. Secure the two table/wall mounting brackets included in the under-desk mounting kit to the switcher with the eight machine screws provided in the kit (figure 2-1).

2. Hold the switcher with attached brackets against the underside of the desk or other furniture. Mark the location of holes for screws on the underside of the desk.
3. Drill 1/4" (6.4 mm) deep, 3/32" (2 mm) diameter pilot holes in the table or desk at the marked screw locations from the underside/inside (concealed side) of the furniture, where the switcher will be located.
4. Insert the four wood screws into the pilot holes. Fasten each screw into the installation surface until just less than 1/4" of the screw head protrudes.
5. Align the installed screws with the slots in the mounting brackets, and place the switcher against the surface, with the screws through the bracket slots.
6. Slide the switcher slightly forward or back, then tighten all four screws to fasten it in place.

Rear Panel Connectors

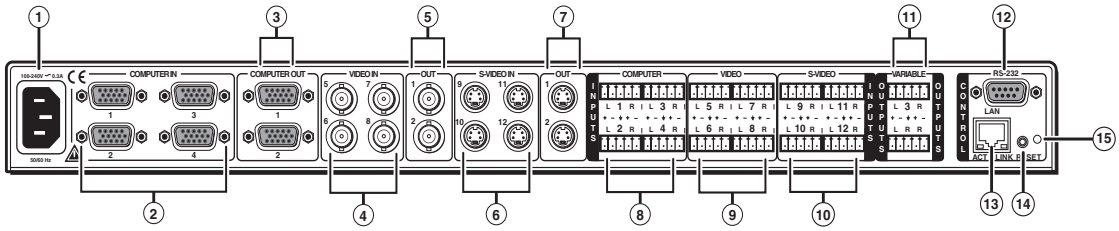


Figure 2-3 — Rear panel of MPX 423 A

(1) **AC power —** Standard AC power connector for a power source of 100 – 240VAC, operating at 50/60 Hz.

(2) **VGA input group —** Four female 15-pin HD connectors for RGB video input (numbered 1 to 4).

(3) **VGA output —** Two female 15-pin HD connectors for RGB video output.

(4) **Composite input group —** Four female BNC connectors for composite input (numbered 5 to 8).

(5) **Composite output —** Two female BNC connectors for composite output.

(6) **S-video input group —** Four female 4-pin Mini DIN connectors for S-video input (numbered 9 to 12).

(7) **S-video output —** Two female 4-pin Mini DIN connectors for S-video output.

(8) **VGA audio input —** Four 3.5 mm female captive screw connectors for audio input from the VGA group. For more information, see *Audio* in Chapter 3, *Operation*.

(9) **Composite audio input group —** Four 3.5 mm, female, captive screw connectors for the composite group input. For more information, see *Audio* in Chapter 3, *Operation*.

(10) **S-video audio input group —** Four 3.5 mm, female, captive screw connectors for the S-video group input. For more information, see *Video/audio group button* in Chapter 3, *Operation*.

(11) **Variable audio output —** Two 3.5 mm, female, captive screw connectors for balanced/unbalance variable audio output.

⑫ **RS-232 —** One female DB9 connector for a host computer or third party controller using Extron's Simple Instruction Set (SIS) or Windows® Control Software.

⑬ **LAN Activity LED —** A blinking yellow LED indicates LAN activity.

LAN connector — Plug an RJ-45 jack into this socket to connect the unit to a computer network. Use a straight-through cable to connect to a switch, hub, or router.

Link LED — The green LED lights to indicate a good LAN connection.

⑭ **Reset button —** A recessed button that allows for a manual reset using a Extron Tweeker, pointed stylus or ballpoint pen. The unit can be reset to five modes (see *Resetting the Unit* in chapter 3 for additional information).

⑮ **Reset LED —** The green LED flashes to show the reset mode indicators and that power is on (see *Resetting the Unit* in chapter 3 for additional information).

Connecting the MPX 423 A Matrix Switcher

The MPX 423 A matrix switcher can be connected to as many as 12 input devices simultaneously, and can output to as many as six devices simultaneously, or one at a time.

Follow the steps below and see the installation example in figure 2-4.

1 Turn off power to the MPX 423 A matrix switcher and all other devices that will be connected.

2 If the MPX 423 A matrix switcher is to be rack, table or furniture mounted, position the brackets and insert the mounting screws. See the *Mounting the Matrix Switcher,* earlier in this chapter.

3 Attach up to four VGA, four composite video, and four S-video, input devices to the MPX 423 A matrix switcher.

4 Connect the switcher's VGA, Video (composite), and S-video outputs (up to six, two of each video format) to the inputs of the display(s).

5 For audio input, connect up to 12 audio sources to the switcher's audio inputs of the VGA, Video (composite), or S-video groups (up to 4 for each group). See figure 2-4 for a connection diagram.

6 For audio output, connect an audio output device to each of the two audio outputs. See *Audio outputs* in chapter 3, *Operation* for wiring diagrams.

7 If the MPX 423 A matrix switcher is to be connected to a computer or host controller for remote control, connect the host's RS-232 cable to the 9-pin female RS-232 connector of the MPX unit. For an RS-232 pinout table, see the *RS-232 and Ethernet Control* later in this chapter.

8 For an Ethernet connection, plug one end of a Cat 5, straight-through Ethernet cable to the RJ-45 LAN port of the switcher. See *RS-232 and Ethernet Control* later in this chapter for pinout instructions.

9 Power up the input and output devices, then connect power to the rear AC connector of the MPX 423 A matrix switcher.

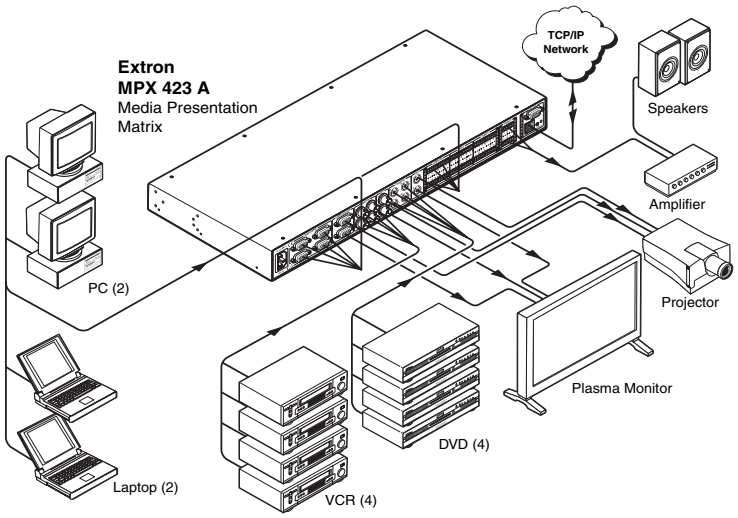


Figure 2-4 — MPX 423 A installation example

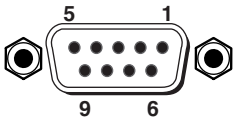
RS-232 and Ethernet Control

For RS-232 control, use a control cable with only pins 2, 3, and 5 connected. Otherwise, either cut the wires to the other pins in hard-shelled connectors or remove the unneeded pins from molded plugs. See chapter 5, *Programmer's Guide*, for definitions of the SIS commands and details on how to install and use the control software.

NOTE *The cable used to connect the RS-232 port to a computer or control system may need to be modified by removing pins or cutting wires. If unneeded pins are connected, communication may not be possible.*

The RS-232 connector is a DB9 female with the following pin designations:

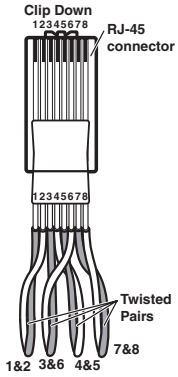
Pin	RS-232	Description
1	—	not used
2	Tx	Transmit data
3	Rx	Receive data
4	—	not used
5	Gnd	Signal ground
6	—	not used
7	—	not used
8	—	not used
9	—	not used



DB9 Pin Locations
Female

The protocol is 9600 baud, 8-bit, 1 stop bit, no parity, and no flow control. The MPX 423 A is also compatible with the following baud rates: 19200, 38400, and 115200.

For Ethernet control, Plug one end of a Cat 5, straight-through Ethernet cable to the RJ-45 LAN port of the switcher. See below for pinout instructions.



Straight-through cable

Side 1		Side 2	
Pin	Wire color	Pin	Wire color
1	White-orange	1	White-orange
2	Orange	2	Orange
3	White-green	3	White-green
4	Blue	4	Blue
5	White-blue	5	White-blue
6	Green	6	Green
7	White-brown	7	White-brown
8	Brown	8	Brown

For more detailed information, see the *Remote Control Port (RS-232)* section in chapter 5.

Chapter Three

Operation

Front Panel Operation

Switcher Modes and Operation

Audio

Resetting the Unit

Front Panel Operation

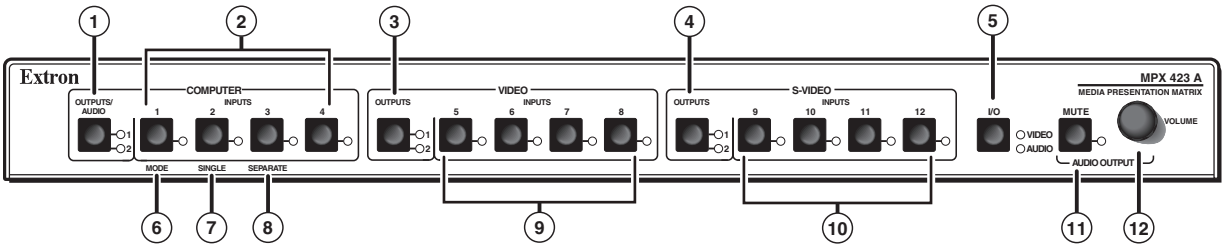


Figure 3-1 — Front panel details of the MPX 423 A matrix switcher

The following sections describe the front panel controls. The controls for the three independent switchers are grouped by input type.

(1) **VGA output —** These two green LEDs serve three functions:

- Displays VGA video output activity.
- Indicates which audio output is active.
- Indicates output selection when setting the switching mode.

(2) **VGA input —** Buttons 1 through 4 select the input for the VGA input sections of the MPX unit. The LEDs adjacent to each button (when lit) indicate which input has been selected for output.

(3) **Composite video output —** Displays which composite video output (output 1 or output 2) is currently active.

(4) **S-video output —** Displays which S-video output (output 1 or output 2) is currently active.

(5) **I/O —** This button serves four functions:

- Allows for toggling between video and audio modes, and simultaneous video/audio functionality.
- Provides a method of accessing the Front Panel Security Lockout function.
- Acts as a system reset button.
- Functions with the Mute button to set an RGB delay.

(6) **Mode —** This is the secondary function of this button (see (2)). The mode function of this button allows the MPX 423 A to be used in either "single" or "separate" mode.

(7) **Single Switcher mode —** This is the secondary function of this button (see (2)). Press and release this button when in "switching mode" (see *Using the switching mode* later in this chapter) to select the Single Switcher mode. The associated LED indicates if the Single Switcher mode is on (when flashing). When the Mode button is released, the LED will resume input indication.

(8) **Separate Switcher mode —** This is the secondary function of this button (see (2)). Press and release this button to select the Separate Switcher mode. The associated LED indicates if the Separate Switcher mode is on (when flashing). When the Mode button is released, the LED will resume input indication.

⑨ **Composite video input —** Buttons 5 through 8 select the input for the composite video sections of the MPX unit. The LEDs adjacent to each button (when lit) indicate which input has been selected for output.

⑩ **S-video input —** Buttons 9 through 12 select the input for the S-video group of the MPX unit. The LEDs adjacent to each button (when lit) indicate which input has been selected for output 1.

⑪ **Audio mute —** This button mutes audio output 1. The LED (when lit) indicates that audio output 1 is muted.

⑫ **Audio volume —** This adjustment knob controls the volume of audio output 1.

Switcher Modes and Operation

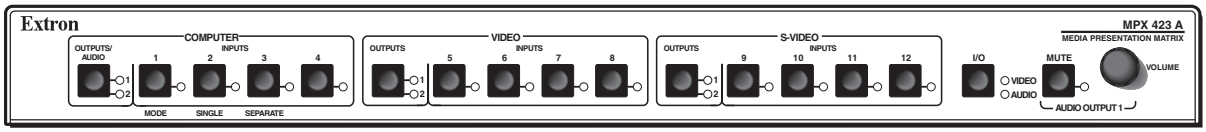


Figure 3-2 — MPX 423 A matrix switcher front panel

Introduction to Single Switcher mode

In Single Switcher mode, the switcher emulates 1 output switcher with 12 inputs. When a video input signal is tied to an output, it is routed to the same video signal format. All other video output signals are muted.

The audio operates independently as a 12 inputs to 2 outputs matrix switcher. See *Audio* later in this chapter for more information.

NOTE *Both outputs can be configured in Single Switcher mode; i.e., the unit emulates two 1 output switchers with 12 inputs each.*

Introduction to Separate Switcher mode

In Separate Switcher mode the switcher emulates three 1 output switchers with 4 inputs. There are three input selection groups on the front panel: Computer, Video (composite), and S-video. These three groups operate independently from each other, and each of the twelve inputs can only be routed to its own video output format group.

The audio operates independently as a 12 inputs to 2 outputs matrix switcher.

NOTE *Both outputs can be configured in Separate mode; i.e., the unit emulates three 2 output switchers with 4 inputs each.*

Establishing a tie

When you connect an input with an output in video or audio, you are establishing a tie. A tie can be a video-only tie (only a video signal is being transmitted through an output), an audio-only tie (only an audio signal is being transmitted through an output) or an audio and video (A/V) tie (a video signal and audio signal are being transmitted together or apart through one or more outputs).

To establish a tie using the MPX 423 A, do the following:

1. Press the I/O button to select a video-only, audio-only, or A/V tie.
2. Select the output using any of the output buttons.
3. Select the input from any of the 12 inputs.

Reading the LEDs

Reading the LEDs of the MPX 423 A matrix switcher is the primary means of controlling your inputs and outputs. The unit uses a series of LED colors and actions to indicate the status of each group and/or tie.

When in audio-only or video-only mode

- A **lit input** LED represents a tie.
- The **lit I/O** LEDs show the signal type (audio or video).

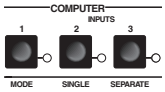
When in A/V mode

- A lit **input** LED represents a video-only tie.
- A **flashing input** LED represents an audio tie.
- A **flashing audio I/O** LED represents audio that follows the video signal.
- An **active video** LED is always lit.

NOTE *A flashing output LED represents a muted state.*

Determining the current switcher mode

As shown at right, the current switcher mode is indicated by the front panel input LEDs of the Computer group.



Using the Switching mode

In order to select or view the single and separate modes of the MPX 423 A, use the *Switching mode*. To use this state to check the unit's current mode status, do the following:

1. Select an output (1 or 2).
2. Press the Mode button for approximately 3 seconds, until the Single and Separate LEDs light. The flashing LED indicates the active mode.

Here, you can choose between Single and Separate mode, and view which one is currently active.

In Switching mode, the only active front panel LEDs are those within the Computer group (Mode, Single, and Separate indicators) shown above and in figure 3-3. This signifies that the unit is in "mode indication" (i.e., you cannot view the current inputs). If a selection is not made during this "mode indication" phase, Switching mode times out.

To change the mode, continue to hold the Mode button and press the button that corresponds to the setting you want to change. Figure 3-3 on the following page shows the front panel buttons and LEDs that are active during Switching mode. Release the Mode button and the front panel LEDs resume input indication.

NOTE *Changes to the Single Switcher mode and Separate Switcher mode take effect when the button is released.*

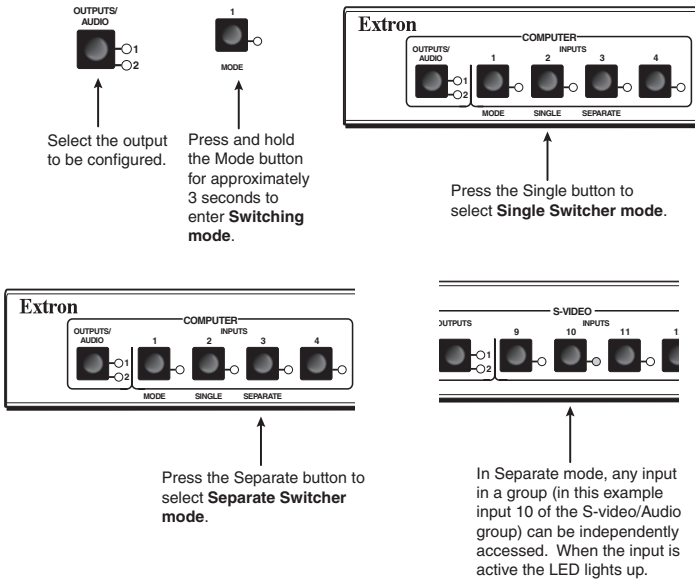


Figure 3-3 — Front panel button/LED functions during Switching mode

Front panel security lockout

Front panel security lockout prevents accidental switching of inputs from the front panel. When front panel security lockout is active, the user can only view the ties in each group; all input buttons and audio functions are locked.

To toggle the front panel lockout on and off, press and hold the I/O button for three seconds. All front panel LEDs flash once to indicate acceptance. When front panel lockout is on, the user can still view the ties by toggling the I/O and output buttons. The LEDs of the corresponding inputs light up according to their tie modes.

If you attempt to make a tie in this mode, the two LEDs of the I/O button flash twice, indicating that no ties can be made from the front panel. RS-232 and Ethernet controls are not affected in this mode.

RGB Delay

The RGB Delay feature clears the screen when the MPX 423 A switches to a new source. The new sync signals precede the RGB signals, so there is no glitch shown during the transition. The time delay between the RGB and sync signals is adjustable in half-second steps of up to five seconds. It can be controlled via RS -232 or the front panel.

To use the front panel to set an RGB delay, do the following:

1. Press and hold the I/O and Mute buttons simultaneously for three seconds. The Video and Output 1 or 2 LEDs flash.
2. Select an output to set, or read the delay settings.
3. Use the volume knob to increase or decrease the delay time. Each input LED lit represents a 0.5 second delay.
4. Press and hold the I/O button to exit.

For information on setting the RGB Delay through Ethernet control, see *Accessing and Using the Web Server* in chapter 6 and the SIS commands listed in chapter 5, *Programmer's Guide*.

Genlock Sync

When switching between inputs in the Video and S-video groups, vertical interval switching is possible. When all input signals are "genlocked" together, the Genlock feature prevents glitches in the video images. The signal connected to input 5 (within the Video group) and input 9 (of the S-Video group) will be used as the reference signal for switching between inputs during the vertical interval.

Audio

The MPX 423 A is also a 12x2 audio matrix switcher, where any of the 12 inputs can be routed to one or both outputs simultaneously.

Establishing an audio tie

Regardless of the switching mode to which the unit is configured (single or separate), the audio behaves like a 12x2 switcher.

To make an audio-only tie, do the following:

1. Select the output using any of the three output buttons. Each of the three output buttons can be toggled between output 1 and output 2.

NOTE *In the audio mode the output buttons are synchronized; i.e., the LEDs indicate the same output number.*

2. Select the audio signal mode using the I/O button.
3. Select any of the 12 inputs.

When one of the 12 input buttons is pressed and released, the audio signal of this input will be routed to whichever audio output is selected.

NOTE *When establishing an audio tie, please note:*

- *The two front panel audio controls only control the audio level of output 1.*
- *A flashing LED indicates an audio tie.*
- *When input LEDs and audio I/O LEDs are flashing simultaneously, the audio and the video signals and* not *in audio breakaway.*

Audio breakaway

Audio breakaway allows you to route the audio signal separately from the video signal. Any audio signal can be selected with any video signal to one or all outputs in any combination, simultaneously.

Audio breakaway switching can be done via front panel control, through RS-232, or via Ethernet remote control.

Volume control (Output 1 only)

Use the Audio Volume control knob to adjust the volume of the audio output. By turning the knob clockwise, the volume increases at a rate of 1dB per step of the digital potentiometer. Turning the knob counterclockwise will decrease the output level.

NOTE *Control of audio output 2 is available through RS-232 or Ethernet/Telnet only.*

The volume adjustment is speed sensitive. To avoid large audible volume jumps when the volume knob is turned quickly, the volume changes by smaller steps.

Audio mute (Output 1 only)

The Mute button toggles between mute and un-mute for audio output 1. The indicator LED to the right of the button lights when the audio is muted. If a muted output is not at maximum attenuation, it is disconnected. Press the Audio Mute button again to un-mute the output and return to the previous output level.

NOTE *Control of audio output 2 is available through RS-232 or Ethernet/Telnet only.*

Audio outputs

Balanced or unbalanced audio output is available on the MPX 423 A using a 3.5 mm, 5-pole captive screw connector. Refer to the following illustration for proper wiring.

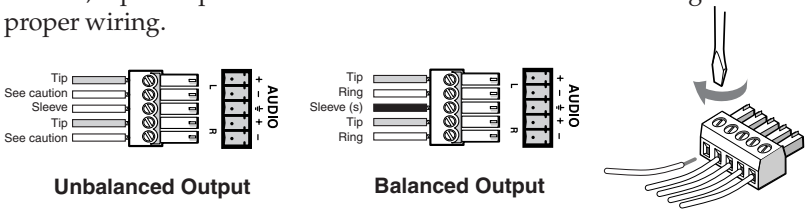


Figure 2-5 — 3.5 mm, 5-pole captive screw audio connectors

CAUTION *Connect the sleeve to ground (Gnd). Connecting the sleeve to a negative (-) terminal damages the audio output circuits.*

Resetting the Unit

There are four reset modes activated by the Reset button in the back of the unit. The Reset button is recessed, so use of a pointed stylus, ballpoint pen, or Extron Tweeker is suggested.

The I/O button on the front panel also has limited reset capabilities, described on the following page.

Hardware reset modes

CAUTION *The reset modes listed below* close *all open IP and Telnet connections, and all sockets.*

NOTE *If the Reset button is continuously held down, the rear panel LED pulses (blinks) every 3 seconds and puts the unit in a different mode (corresponding to the underscored notes in Modes 3 through 5). The third blink indicates the last mode, Mode 5, so the LED blinks three times. The following modes are listed as separate functions, not as a continuation from Mode 1 to Mode 5.*

Mode 1: Holding the Reset button while applying power defaults the unit back to the base firmware that shipped with the unit from the factory. Event scripting does not start when the unit is powered on in this mode. This allows you to recover a unit that has incorrect code or updated firmware running. All user files and settings are maintained. User Web pages may not work correctly if the unit is using an earlier firmware version.

Mode 3: Holding the Reset button until the I/O LED blinks once (3 seconds) followed by a momentary (<1 second) press turns events either on or off, depending on the current state of the events:

- If the events are currently stopped following the momentary (<1 second) press, the I/O LED will *flash twice* indicating the starting of events.

or

- If events are currently running following the momentary (<1 second) press, the I/O LED *flashes three times*, indicating the stopping of events.

Each flash lasts for .25 seconds. Nothing happens if the momentary press does not occur within 1 second.

Mode 4: Holding the Reset button until the I/O LED blinks twice (6 seconds) followed by a momentary (<1 second) press will reset IP settings. The I/O LED blinks four times in quick succession, confirming a Mode 4 reset. This mode

1. Enables ARP program capability
2. Sets IP back to factory IP
3. Sets Subnet back to factory default
4. Sets Gateway back to factory default
5. Sets port mapping back to factory default
6. Turns DHCP off
7. Turns events off

Nothing happens if the momentary press does not occur within one second.

Mode 5: Holding the Reset button until the I/O LED blinks three times (9 seconds) followed by a momentary (<1 second) press causes a complete system reset back to factory default conditions. Nothing happens if the momentary press does not occur within 1 second. The I/O LED *blinks four times in quick succession,* confirming a Mode 5 reset.

Factory reset modes

Factory resets can be set using the front panel I/O button. To reset the MPX 423 A to factory defaults

1. Press and hold the I/O button on the front panel while plugging in AC power.
2. Continue to hold the I/O button until all LEDs on the front panel flash.

Once the I/O button is released, power-up continues and the LEDs go back to their default configuration.

Chapter Five

Programmer's Guide

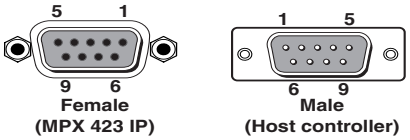
Remote Control Port (RS-232)

Host-to-MPX Communications

Command/Response Table

Remote Control Port (RS-232)

The MPX 423 A matrix switcher RS-232 port connector is used to connect to a host or external controlling device, such as a computer or control system, which can generate the proper command codes and recognize the switcher's responses.



NOTE *The cable used to connect the RS-232 port to a computer or control system may need to be modified by removing pins or cutting wires. If unneeded pins are connected, the switcher may hinder communication. See chapter 2,* Installation, *for more information on wiring the connectors.*

The RS-232 connector is a DB9 female (see illustration above) with the following pin designations:

Pin	RS-232	Description
1	—	not used
2	Tx	Transmit data
3	Rx	Receive data
4	—	not used
5	Gnd	Signal ground
6	—	not used
7	—	not used
8	—	not used
9	—	not used

The protocol is 9600 baud, 8-bit, 1 stop bit, no parity, and no flow control. The MPX 423 A is also compatible with the following baud rates: 19200, 38400, and 115200.

Commands and responses for programming the MPX 423 A from a host system connected to the RS-232 port are listed on the following pages.

Host-to-MPX Communications

The MPX 423 A matrix switcher accepts SIS™ (Simple Instruction Set) commands through the RS-232 port or through Telnet. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each response to an SIS command ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

Using the command/response table

The command/response table is shown on the following pages. Lowercase characters are acceptable in the command field only where indicated. Symbols are used throughout the table to represent variables in the command/response fields. Symbol definitions are shown below, and an ASCII-to-hexadecimal (HEX) conversion table is shown in figure 5-1. Command and response examples are shown throughout the command/response table.

ASCII to HEX Conversion Table										Esc	1B	CR	ØD	LF	ØA
	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	4Ø	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

Figure 5-1 — ASCII-to-hexadecimal conversion table

Symbol Definitions

↵ = CR/LF • = space ← = CR (no line feed) [Esc] = escape

[X1] = 1 thru max. number of inputs

[X2] = 0 thru max. number of inputs
(Input 0 = muted output)

[X3] = Outputs 1 through 6
(1, 2 = VGA and Audio; 3, 4 = Composite Video; 5,6 = S-Video)
Single switch **mode 1 or 2 only**

[X4] = -18 thru +24
(43 steps of audio gain or attenuation)

[X5] = 0 db thru 24 db (audio gain)

[X6] = 0 db thru 18 db (audio attenuation)

[X7] = Volume adjustment range (0%-100%).
(volume min. = 0 through volume max. = 64)
In 1 dB steps except from 1 to 0 = -30dB

[X9] = On/Off status: 0 = off/disable ; 1 = on/enable

[X10] = Signal/No Signal: 0 = no signal at input; 1 = signal at input

[X11] = 2 = Separate 1; = Single, (switcher mode)

[X13] = Delay in ½ second increments (10 max. = 5.0 seconds)

[X14] = Video/Audio Mute:
0 = no mute; 1 = video; 2 = audio; 3 = video and audio mute

[X15] = xxx.xx (frequency in Hz or kHz)

[X16] = Dirty status: 0 = RAM has been saved to Flash (OK to power off/reset);
1 = RAM needs to be saved to Flash

[X17] = 10s of milliseconds wait time for characters coming into a serial port before terminating (default=10=100ms, max=32767)

[X18] = 10s of milliseconds wait time between characters coming into a serial port before terminating (default=2=20ms, max.=32767)

[X19] = Controller firmware version to the second decimal place

[X20] = Verbose firmware version – description – upload date/time

X22 = Power supply voltages and Temperature (in degrees, Fahrenheit)
(+5.0V, +3.3V, +2.5V, +15.0V, -5.0V, -15.0V, Temp)

X25 = Matrix name (24 characters max.)
Invalid characters: + ~ @ = ‘ [ ] { } < > “ ; : | \ ?

X26 = GMT date [WWW,•DD•MMM•YYYY•HH:MM:SS•GMT]

X27 = IP address [###.###.###.###]

X28 = E-mail event number: range = 1 – 64 (Max.)

X29 = Default name: Combination of model-name and last 3 pairs of MAC address (*e.g., MPX-423-A-00-02-3D*)

X30 = Password (12 digits, alphanumeric)

X31 = Connection's security level: 0 = not logged in; 1 = User; 2 = Administrator

X32 = E-mail user name (up to 240 characters). Email name for the matrix

X33 = E-mail address (Uses typical email address format)

X34 = Hardware address [##-##-##-##-##-##]

X35 = 0 –255 number of open connections

X37 = GMT date [MM/DD/YY•HH:MM:SS]

X38 = Domain name [example = extron.com]

X39 = GMT offset (-12.0 through +14.0 hours and minutes removed from GMT).

X40 = Daylight Savings time: 0 = Daylight savings time off/ignore;
1 = Daylight savings time on (northern hemisphere)

X41 = E-mail account [1 through 64]

X45 = DHCP [0 = off, 1 = on]

X46 = Port # 01. The port number will be represented as two ASCII characters (2 bytes) (*e.g., port 01 would be represented as 30 31 in hex*)

X47 = Baud rate (9600, 19200, 38400, 115200)

X48 = Parity: **O**dd, **E**ven, **N**one, **M**ark, **S**pace (only first letter required).

X49 = Data bits (7 or 8)

X50 = Stop bits (1 or 2)

X51 = Port type (0= RS-232)

X52 = Flow control: **H**ardware, **S**oftware, **N**one (only use the first letter)

X53 = Data pacing (specified in milliseconds between bytes):
0000 – 1000 (default = 0 ms)

X54 = Web page priority flag (**internal use only**):
0 = Internal (default on power up); 1 = User

Error responses

When the MPX 423 A matrix switcher receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the switcher is unable to perform the command because the command is invalid or contains invalid parameters, it returns an error response to the host. The error response codes are:

E01↵ — Invalid input channel number

E10↵ — Invalid command

E11↵ — Invalid preset number

E12↵ — Invalid output number / Invalid port number

E13↵ — Invalid parameter

E14↵ — Command not available for matrix configuration

E17↵ — Timeout (only caused by direct write of global presets)

E22↵ — Busy

E24↵ — Privilege violation (Ethernet, Extron software only) User privileges have access to ALL view and read commands, and the following:

- Create Ties
- Create and Recall Presets
- Set RGB and Audio Mutes

Exception to the rule: User cannot read Admin Password

E25↵ — Device not present

E26↵ — Maximum number of connections exceeded

E27↵ — Invalid Event number

E28↵ — Bad Filename / File not found

References to errors

[24] = Commands that give E24 (privilege violation) if not administrator level.

Copyright information

(c) Copyright 2004, Extron Electronics, MPX 423 A, Vx.xx↵

The copyright message is initiated by the MPX 423 A matrix switcher when it is first powered on. Vx.xx is the firmware version number.

Command/response table for Simple Instruction Set (SIS) commands

Command	ASCII	Hex	Unit response
Input selection (in Single and Separate Switcher modes)			
Tie input (A and V)	X2 * X3 !	(X2+30h) 2A (X3+30h) 21	Out X3 •In X2 •All ↵
Tie input RGBHV (VGA)	X2 * X3 &	(X2+30h) 2A (X3+30h) 26	Out X3 •In X2 •RGB ↵
Tie input video	X2 * X3 %	(X2+30h) 2A (X3+30h) 25	Out X3 •In X2 •Vid ↵
Tie input audio	X2 * X3 $	(X2+30h) 2A (X3+30h) 24	Out X3 •In X2 •Aud ↵
Tie an input to all outputs (audio only):			
	X2*$	(X2+30h) 2A 24	In X2 •Aud ↵
View			
Video output tie	X3 %	(X3+30h) 25	X2 ↵
RGBHV output tie	X3 &	(X3+30h) 26	X2 ↵
Audio output tie	X3 $	(X3+30h) 24	X2 ↵
Audio gain for input	X1 G	(X1+30h) 47	X4 ↵
Audio volume for output	X3 V/v	(X3+30h) 56/76	X7 ↵
Switcher Mode Select			
Switcher mode selection	X3*X11*1#	2A (X3+30h) 2A (X11+30h) 31 23	X3 Swm X11 ↵
View Switcher mode	X3*1#	(X3+30h) 31 2A 23	X11 ↵
Note: 1: Switcher mode selection *X11: 1 = Single Mode; 2= Separate Mode (default mode)*			
Setting Input Audio Gain/Attenuation			
Positive (+db)	X1* X5 G	(X1+30h) 2A (X5+30h) 47	In X1 •Aud X4 ↵
Attenuation (-db)	X1* X6 g	(X1+30h) 2A (X6+30h) 67	In X1 •Aud X4 ↵
Increment	X1 +G	(X1+30h) 2B 47	In X1 •Aud X4 ↵
Decrement	X1 -G	(X1+30h) 2D 47	In X1 •Aud X4 ↵
View input gain	X3 G/g	(X1+30h) 47	X4 ↵
Setting output audio volume			
Increment	X3 +V/v	(X3+30h) 2B 56/76	Out X3 •Vol X7 ↵
Decrement	X3 -V/v	(X3+30h) 2D 56/76	Out X3 •Vol X7 ↵
Output level	X3*X7 V/v	(X3+30h) 2A (X7+30h) 56/76	Out X3 •Vol X7 ↵
View volume	X3 V	(X3+30h) 56	X7 ↵
Audio mute			
Audio mute	X3*1Z/z	(X3+30h)2A 315A/7A	Amt X3 *1 ↵
Audio un-mute	X3*0Z/z	(X3+30h)2A 30 5A/7A	Amt X3 *0 ↵
Read audio mute	X3 Z/z	(X3+30h)5A/7A	X9 ↵
Mute On	1*Z/z	31 2A 5A/7A	Amt 1 ↵
Mute Off	0*Z/z	30 2A 5A/7A	Amt 0 ↵
RGB Delay (Triple Action Switching)			
Set RGB Delay	ESC X3 * X13 D/d ← 1B	(X3+30h) 2A (X13+30h) 44/64 0D	Out X3 •Dly X13 ↵
Read RGB Delay	ESC X3 D/d ←	1B (X3+30h) 44/64 0D	X13 ↵
RGB/VIDEO Mute			
RGB/Video Mute	X3*1B/b	(X3+30h) 2A 31 42/62	Vmt X3 *1 ↵
RGB/Video Un-mute	X3*0B/b	(X3+30h) 2A 30 42/62	Vmt X3 *0 ↵

Command	ASCII	Hex	Unit response
Read RGB/VideoMute	X3 B/b	(X3+30h) 42/62	X9 ↵
***Note**: User may also use input 0 (zero) for mute (i.e., 0*1! = mutes output 1 for Video and Audio).*			
View Output Mutes	ESC VM ←	1B 56 4D 0D	X14(1), X14(2), X14(3), X14(4), X14(5) X14(6) Mut ↵
***Note**: Output 1 and 2 = VGA and audio; output 3 and 4 = video only; output 5 and 6 = S-video only*			
List DSVP (Digital Sync Validation Processing)			
List ind. Sync (DSVP) (*VGA inputs only*)	X1 LS	(X1+30h) 4C 53	X15, X15 ↵ Listed as Horz, Vert - xxx.xx,xxx.xx ↵
***Note**: If there is no connection or error, the unit responds with 000.00, 000.00.*			
List all (DSVP)	0LS	30 4C 53	X10, X10, X10, X10, X10, X10, X10, X10, X10, X10, X10 ↵
***Example**: "0LS" Unit response* = 0 1 0 1 1 1 0 0 1 0 1 1 ↵ *In this example, signals are present on VGA inputs 2, 4; Video inputs 1, 2; and S-video inputs 1, 3, 4.*			
Front Panel Security lockout Mode			
Locked	1X/x	31 58/78	Exe 1 ↵
Un-Locked	0X/x	30 58/78	Exe 0 ↵
View Lock Status	X/x	58/78	X9 ↵
Request Information			
	I/i	49/69	Vga1*X2 Vga2*X2 Vid1*X2 Vid2*X2 Svd1*X2 Svd2*X2 Aud1*X2 Aud2*X2 ↵
Request Part Number			
	N/n	4E/6E	xx-xxx-xx ↵
Query Firmware Version			
	Q/q	51/71	X19 ↵
Query Software Version			
	0Q/q	30 51/71	X19 X20 X20 ↵
Request system status			
	S	53	X22 ↵
System Reset (Factory Default)			
	ESC ZXXX ←	1B 5A 58 58 58 0D	Zpx ↵
Absolute System Reset (Include IP address = 192.168.254.254, subnet mask = 255.255.0.0)			
	ESC ZQQQ ←	1B 5A 51 51 51 0D	Zpq ↵
IP Setup Commands			
Set matrix name (location)	ESC X25 CN ←	1B X25 43 4E 0D	Ipn X25 ↵
Set Unit name to factory default [24]	Esc • CN ←		Ipn • X29 ↵

Command	ASCII	Hex	Unit response
Read matrix name (location)	ESC CN ←	1B 43 4E 0D	X25 ↵
Set Time/Date	ESC X37 CT ←	1B X37 43 54 0D	Ipt X37 ↵
Read Time/Date	ESC CT ←	1B 43 54 0D	X26
Set GMT, Offset	ESC X39 CZ ←	1B X39 43 A5 0D	Ipt X39 ↵
Read GMT, Offset	ESC CZ ←	1B 43 A5 0D	X39 ↵
Set Daylight Savings time	ESC X40 CX ←	1B X40 43 58 0D	Ipt X40 ↵
Read Daylight Savings time	ESC CX ←	1B 43 58 0D	X40 ↵
Configure parameters[24]	Esc X1 * X47,X48,X49,X50 CP ←		Cpnx1•Ccp , X47, X48, X49, X50
Read com-port parameters	ESC X46 CP ←	1B X46 43 50 0D	X47, X48, X49 X50 ↵
Set com-port mode	ESC X46* X51 CY	1B X46 A2 X51 43 48 0D	Cpn X46• Cty X51 ↵
Read com-port mode	ESC X46 CY ←	1B X46 43 48 0D	X51 ↵
Configure Flow control[24]	Esc X46 * X52,X53 CF ←		Cpn X1• Cfl X52, X53 ↵
View Flow control	Esc X46 CF ←		X52,X53 ↵
Configure rcv timeout[24]	Esc X46*X17*X18CE ←		Cpn X46• Cce X17, X18 ↵
View receive timeout	Esc X46 CE ←		X17, X18 ↵
Set DHCP on or off	ESC X45 DH ←	1B X45 44 48 0D	Iph X45 ↵
Read DHCP status	ESC DH ←	1B 44 48 0D	X45 ↵
Set IP address	ESC X27 CI ←	1B X27 43 49 0D	Ipi X27 ↵
Read IP address	ESC CI ←	1B 43 49 0D	X27 ↵
Read hardware address (MAC)	ESC CH ←	1B 43 48 0D	X34 ↵
Set subnet mask	ESC X27 CS ←	1B X27 43 53 0D	Ips X27 ↵
Read subnet mask	ESC CS ←	1B 43 53 0D	X27 ↵
Set gateway	ESC X27 CG ←	1B X27 43 47 0D	Ipg X27 ↵
Read gateway	ESC CG ←	1B 43 47 0D	X27 ↵
Set administrator password	ESC X30 CA ←	1B X30 43 41 0D	Ipa X30 ↵
Clear administrator password[24]	Esc • CA ←		Ipa• ↵
Read administrator password	ESC CA ←	1B 43 41 0D	X30 ↵
Set user password	ESC X30CU ←	1B X30 43 55 0D	Ipu X30 ↵
Clear user password[24]	Esc • CU ←		Ipu• ↵
Read user password	ESC CU ←	1B 43 55 0D	X30 ↵
Set mail sever IP, domain name	ESC X27, X38 CM ←	1B X27, 2C X38 43 4D 0D	Ipm X27, X38 ↵
Read mail sever IP, username, password	ESC CM ←	1B 43 4D 0D	X27, X32, X30 ↵
Set e-mail recipient	ESC X41 , X33CR ←	1B X41 2C X33 43 52 0D	Ipr X33 ↵
Read e-mail recipient	ESC CR ←	1B 43 52 0D	X33 ↵
Send e-mail (event)	Esc X28 SM ←		Eml X28 ↵

Command	ASCII	Hex	Unit response
Switch web page priority[24]	Esc X54 Cpag ←		Iwp X54 ↵
View web page priority	Esc Cpag ←		X54 ↵
Set verbose mode[24]	Esc X9 CV ←		Vrb X9 ↵
Read verbose mode	Esc CV ←		X9 ↵
Read connection's security level	Esc CK ←		X31 ↵
Commit RAM to Flash	Esc 1FF ←		Nvr X16 ↵ (responds when done)
View whether RAM needs to be saved to Flash.	Esc FF ←		X16 ↵

Chapter Six

Ethernet Control

Accessing and Using the Web Server

Navigating the Default Web Pages

Special Characters

Ethernet Control

The MPX 423 A matrix switcher features an on-board Web server, displayed as a set of default Web pages. These pages allow you to control and operate the MPX unit through its Ethernet port, connected via a LAN or WAN, using a Web browser such as Microsoft's Internet Explorer (version 5.5 or higher), or Netscape Navigator (version 6.0 or higher).

This chapter describes these default Web pages, which are always available and cannot be erased or overwritten.

Accessing and Using the Web Server

Access the switcher through the on-board Web server pages as follows:

1. Double click the Web browser icon on your Windows desktop to launch your Web browser.
2. Click in the browser's Address field.
3. Enter your MPX 423 A IP address in the browser's Address field.

NOTE *If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the correct value for this field.*

4. If you want the browser to display a page other than the default page (such as a custom page that you have created and uploaded), enter a slash (*/*) and the file name to open.

NOTE *The browser's Address field should display the address in the following format:* xxx.xxx.xxx.xxx/{optional_file_name.html*}*

NOTE *The following characters are invalid in file names:* {space} ~ @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.

5. Press the keyboard Enter key.

   The switcher checks to see if it is password protected.

   If the switcher is not password protected, proceed to step **7**.

   If the switcher is password protected, the switcher downloads the Enter Network Password page (figure 6-1).

Figure 6-1 — Network Password window

NOTE *A User Name entry is not required.*

6. Click in the Password field and type in the appropriate administrator or user password.
7. Click the *OK* button.

The switcher checks several possibilities, in the following order, and then responds accordingly:

a. Does the address include a specific file name, such as 10.13.156.10/file_name.html? **If so**, the switcher downloads that HTML page.

b. Is there a file in the switcher's memory that is named "index.html"? **If so**, the switcher downloads "index.html" as the default start-up page.

c. **If neither of the above conditions is true**, the switcher downloads the factory-installed default start-up page, "nortxe_index.html" (figure 6-2), also known as the System Status page.

Navigating the Default Web pages

The MPX 423 A default Web pages include four tabs (Status, Configuration, File Management, and Control) for easy navigation of several administrative options including system status, password control, file management, and video/audio settings.

Status

The Status tab includes pages that show the current System Status and DSVP data for the MPX 423 A.

System Status page

The System Status page (figure 6-2), is the default page of the on-board Web server, and provides an overall view of the status of the complete matrix switcher. It provides immediate system information, power status and serial port settings for the MPX unit.

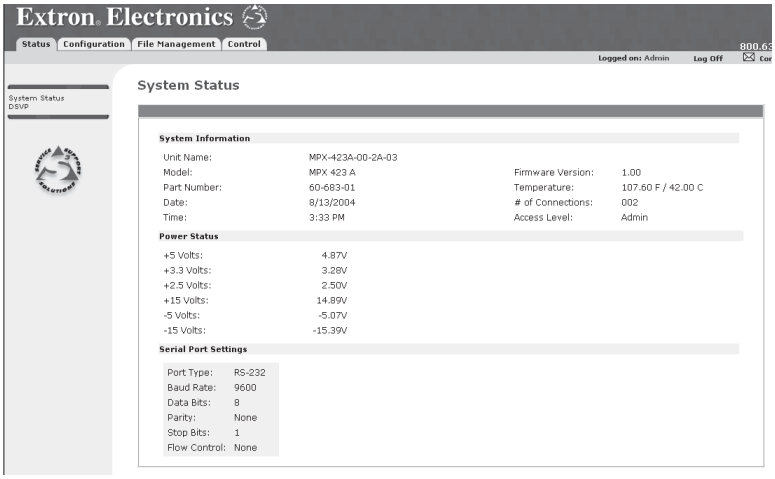


Figure 6-2 — System Status page

DSVP page

The DSVP page, accessible from the left side under the Status tab, allows you to view a snapshot-in-time of the input frequencies of connected inputs on the Digital Sync Validation Processing (DSVP) page, as shown on the following page (figure 6-3).

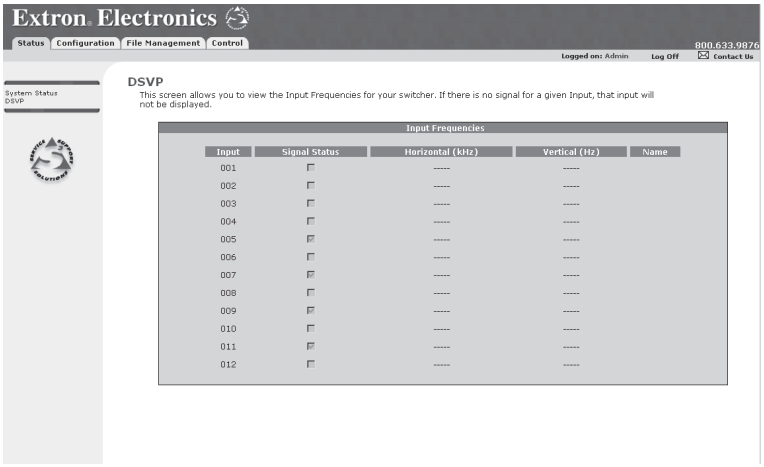


Figure 6-3 — DSVP page

Configuration

The Configuration tab includes pages that show the current System Settings, Passwords and Firmware Upgrade data for the MPX 423 A.

System Settings page

The Systems Settings page (figure 6-4) consists of fields where you can view and edit IP administration and system settings. Date and time information can be easily updated.

NOTE *Access to the MPX 423 A settings using the Ethernet port is not password protected. Ensure only knowledgeable and qualified personnel access the switcher using HTML control.*

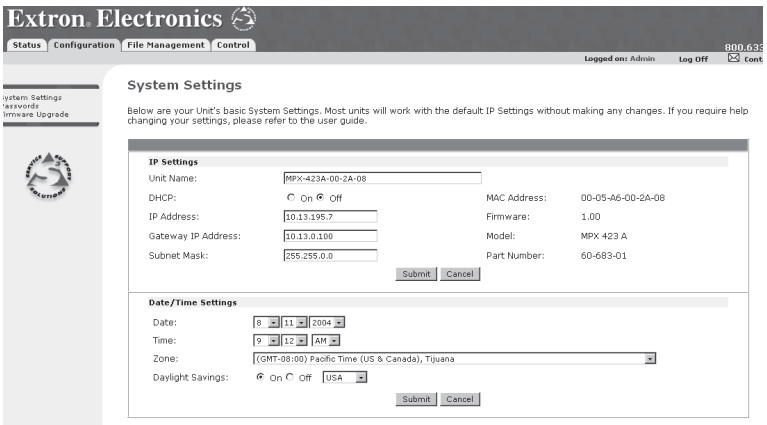


Figure 6-4 — System Settings page

IP settings fields

The IP settings fields provide a location for viewing and editing settings unique to the Ethernet interface. After editing any of the settings on this page, click the *Submit* button. Explanations for some of these fields follows.

Unit Name

This name field can be changed to any valid name, up to 12 alphanumeric characters.

NOTE *The following characters are invalid in the matrix name:* {space} ~ @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.

DHCP

The Dynamic Host Configuration Protocol (DHCP) is an Internet protocol for automating the configuration of computers that use TCP/IP. DHCP can be used to automatically assign IP addresses, deliver TCP/IP stack configuration parameters such as the subnet mask and default router, and provide other configuration information such as the addresses for printer, time and news servers. For specific settings information, see your system administrator.

IP Address

The MPX 423 A IP Address field contains the IP address of the connected matrix switcher. This value is encoded in the flash memory in the switcher.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

The default address is 192.168.254.254, but if this conflicts with other equipment at your installation, you can change the IP address to any valid value.

NOTE *Editing the Extron IP address while connected via the Ethernet port can immediately disconnect the user from the matrix switcher. Extron recommends editing this field using the RS-232 link and protecting the Ethernet access to this screen by assigning an administrator's password to qualified and knowledgeable personnel only.*

Edit this field as follows:

1. Click in the MPX 423 A IP address field. The graphic cursor becomes a text cursor.
2. Edit the address as desired.
3. Press the Tab key on the keyboard or click in another field to exit the IP Address field.
4. Click on the *Submit* button to make the address change take affect.

Gateway IP address

The Gateway IP Address field identifies the address of the gateway to the mail server to be used if the MPX 423 A switcher and the mail server are not on the same subnet.

The gateway IP address has the same validity rules as the system IP address.

Subnet mask field

The Subnet Mask field is used to determine whether the MPX 423 A switcher is on the same subnet as the mail server when you are subnetting.

Hardware address field

The hardware address is hard-coded in the switcher and cannot be changed.

Passwords

The fields on the Passwords page are for entering and verifying administrator and user passwords. Passwords are case sensitive and are limited to 12 upper case and lower case alphanumeric characters. Each password must be entered twice; once in the Password field and then again in the Re-enter Password field. Characters in these fields are masked by asterisks (*****).

NOTE *The following characters are invalid in passwords:* {space} + ~ @ = ' [ ] { } < > ' " ; : | \ and ?.

If you do not want to password protect an access level, leave the Password field and the Re-Enter password field blank. After entering the desired password in both fields, click the *Submit* button.

As shown in figure 6-5 below, password-protected connections allow two levels of protection: *administrator* and *user*. Administrators have full access to all MPX 423 A switching capabilities and editing functions. Users can only create ties, set video and audio mutes, and view all settings, with the exception of passwords.

NOTE *The MPX 423 A does not feature preset options.*

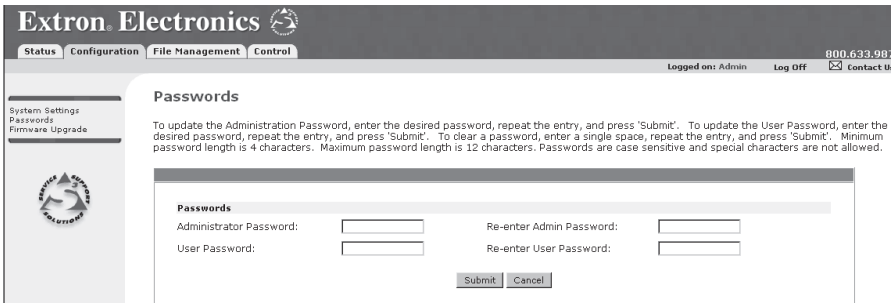


Figure 6-5 — Passwords page

Please keep in mind that

- connecting via an Ethernet connection, entering SIS commands (see chapter 5, *Programmer's Guide*) or using the Windows®-based control program to access the MPX **is** password protected.
- connecting via the RS-232 port, entering SIS commands or using the Windows-based control program to access the MPX **is not** password protected.

NOTE *An administrator password must be created before a user password can be created.*

To clear an existing password so that no password is required, delete the asterisks in the Password field and place a blank space in the field. Click the *Submit* button.

Firmware upgrade page

The Firmware Upgrade page (figure 6-6) provides a way to replace the firmware that is coded on the switcher's control board without taking the switcher out of service, opening the switcher enclosure, and replacing the firmware chip.

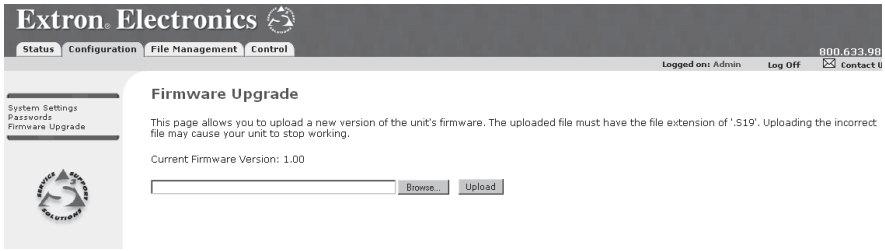


Figure 6-6 — Firmware Upgrade page

NOTE *The Firmware Upgrade page is **only** for replacing the firmware that controls all switcher operation. To insert your own HTML pages, see* File Management *later in this chapter.*

Insure that your PC is connected to the MPX 423 A switcher via the switcher's Ethernet port. Update the switcher firmware as follows:

1. Visit the Extron web site at **www.extron.com**.
2. Select the MPX 423 A product category from the "Product Shortcut" drop-down box, and select the latest firmware file for download.
3. Note the folder to which you save the firmware file.
4. Connect the PC to the MPX 423 A switcher via the switcher's Ethernet port.
5. Access the MPX 423 A switcher using the on-board Web server.
6. Click the Configuration tab.
7. Click the Firmware Upgrade link.
8. Click the *Browse* button. An open file window appears.
9. Navigate to the folder where you saved the firmware upgrade file. Select the file.

NOTE *Valid firmware files must have the file extension '.S19'. Any other file extension is **not** a firmware upgrade.*

NOTE *The original factory-installed firmware is permanently available on the MPX 423 A switcher. If the attempted firmware upload fails for any reason, the switcher automatically reverts to the factory-installed firmware.*

12. Click the *Open* button.
13. Click the *Upload* button. The firmware upload to the MPX 423 A switcher may take a few minutes.

File Management

The File Management page (located under the File Management tab), is a useful tool that allows you to use and upload existing and custom Web pages. Custom pages can be developed using a third-party Web page development program such as FrontPage or Dreamweaver. File management also allows you to remove unnecessary or outdated files when they are no longer needed.

To add or update files:

1. Select the File Management tab and the File Management screen (figure 6-7) is displayed.

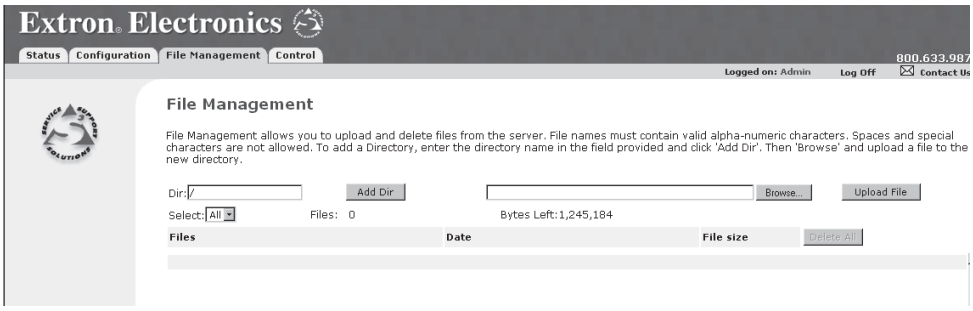


Figure 6-7 — Web server File Management screen

2. Click the Browse button to locate the file(s) you want to upload.

   NOTE *If you want one of the pages that you create and upload to be the default start-up page, name that file "index.html".*

3. Click the Upload File button to upload the file.

The file will be added to the list of files under the Files column. After ten files have been loaded, additional file management pages will appear in the page navigation area (on the right side of the screen).

To add a directory:

1. Enter the directory name in the Dir field.
2. Click the Add Dir button.
3. Click the browse button, and locate your chosen directory.
4. Upload a file to the new directory.

To delete unwanted files:

1. Select the File Management tab and the File Management screen (figure 6-7) is displayed.
2. Find the file you wish to delete under the Files list.
3. Click the delete button of the file to be deleted. If you wish to delete additional files, wait for the screen to refresh before clicking the delete button of the next file.

If you wish to delete all files, click the Delete All button. The file count will revert to 0 and all subsequent pages will be deleted.

Control

The Control tab allows access to the Set and View Ties page (figure 6-8), and the Video and Audio Settings page for the MPX 423 A.

Set and View Ties Page

Use the Set and View Ties page (figure 6-8) to quickly view and change input to output ties.

As shown on the following page (figure 6-8), the Set and View Ties page shows a representation of the MPX 423 A front panel, where the Computer (VGA) inputs, the video (composite) inputs, and the S-Video inputs are shown in their 4x2 groupings. Output modes can be easily identified as Single or Separate.

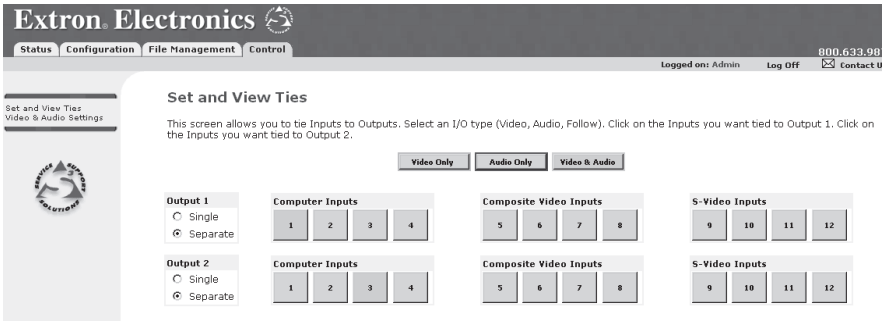


Figure 6-8 — Set and View Ties page

The status of each tie is visible through buttons of three different colors:

- An **amber** button indicates **video and audio ties**.
- A **green** button indicates **video only ties**.
- A **red** button indicates **audio only ties**.
- The **gray** buttons indicate **no ties**.

Creating a tie

Select and switch an input as follows:

1. Click the *Video Only, Audio Only*, or *Video & Audio* button to select video, audio, or both for switching (audio follow or audio breakaway). Each mouse click on a button toggles the other two buttons off.
2. Move the mouse over the input and output selection buttons. Click on a button to create a tie (if not tied) or untie (if tied) of the input and output associated with that button. The button color represents the signal type for the tie: **green** for video, **red** for audio and **amber** for audio/video.

Video & Audio Settings page

The Video & Audio Settings page (figure 6-9) provides a way to set the input audio gain and attenuation, set the output volume, mute and unmute all video and audio outputs, and set the video delay (switching interval).

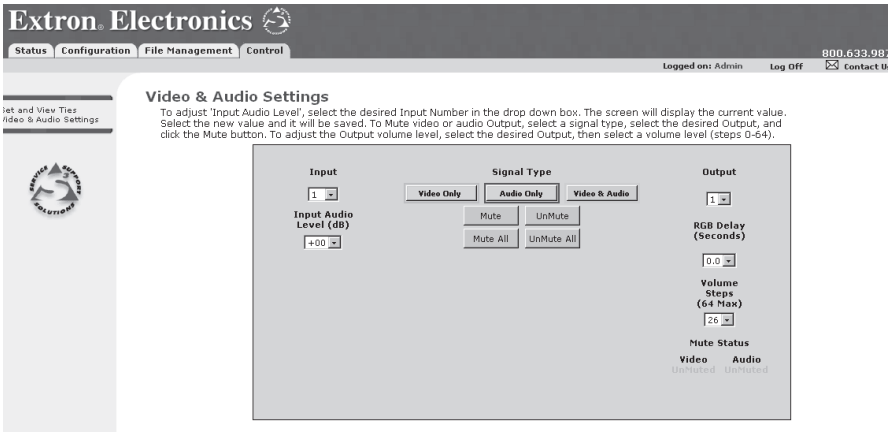


Figure 6-9 — Video and Audio Settings page

Change the input gain and attenuation

Users can set each input's level of audio gain or attenuation (-18dB to +24dB) from the video & Audio Settings page. Audio levels can be adjusted so there are no noticeable volume differences between sources.

Change an input's audio level setting as follows:

1. Click the Input drop box. A drop down scroll box appears (figure 6-10).

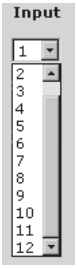


Figure 6-10 — Input selection drop box

2. Click and drag the slider or click the scroll up (▲) button or scroll down (▼) button until the desired input is visible.
3. Click the desired input.
4. Click the Input Audio Level (dB) drop box. A drop down scroll box appears (figure 6-11).

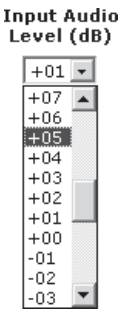


Figure 6-11 — Gain drop box

5. Click on the desired gain or attenuation value.

Mute and unmute one or all outputs

Mute one or all outputs as follows:

1. **To select an individual output to mute or unmute**, click on the Output drop box. A drop down scroll box appears (figure 6-12).

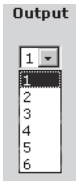


Figure 6-12 — Output selection drop box

2. Click the desired output.

3. Click the *Video Only, Audio Only*, or *Video & Audio* button to select video, audio, or both for muting. Each mouse click on a button toggles the other two buttons off.

4. Click the *Mute* or *UnMute* button to mute or unmute the selected output, or click the *Mute All* or *UnMute All* to mute or unmute all of the outputs.

   Observe the Mute status indications on the page (figure 6-13). Unmuted is displayed in green and muted is displayed in red.

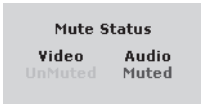


Figure 6-13 — Mute status indications

NOTE *If you choose an output number greater than 2, (i.e., outputs 3 or 4 for Video signals and 5 or 6 for S-video signals) the Mute options are no longer accessible.*

Using RGB Delay

Users can use the RGB Delay feature to insure smooth, glitch-free transitions between input of the Computer group only. With a range of half second increments, the maximum delay possible is 5 seconds.

To use the RGB Delay feature

1. Click on the RGB Delay drop box. A drop down scroll box appears (figure 6-14).

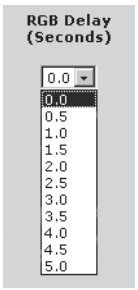


Figure 6-14— Output selection drop box

2. Click the desired time (in seconds) for the output delay.

NOTE *If you choose an output number greater than 2, (i.e., outputs 3 or 4 for Video signals and 5 or 6 for S-video signals) the RGB Delay options are no longer accessible.*

Change the output volume level

Users can set each output's volume level through a range from zero steps of attenuation (full attenuation, minimum volume) to 64 steps of attenuation (no attenuation, full volume) from the Video & Audio Settings page.

NOTE *If you choose an output number greater than 2, (i.e., outputs 3 or 4 for Video signals and 5 or 6 for S-video) the volume level options are no longer accessible.*

Change an output's audio level setting as follows:

1. Click on the output drop box. A drop down scroll box appears (figure 6-14).

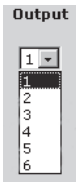


Figure 6-15— Output selection drop box

2. Click on the desired output.
3. Click on the Volume Steps (64 Max) drop box. A drop down scroll box appears (figure 6-16).

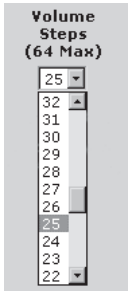


Figure 6-16— Volume drop box

4. Click on the desired output volume step value.

NOTE *The table on the next page defines the value of each audio volume step.*

X7 value	dB of attenuation	Output volume	X7 value	dB of attenuation	Output volume	X7 value	dB of attenuation	Output volume
00	98	0%						
01	63	5.5%	23	41	38.5%	45	19	71.5%
02	62	7%	24	40	40%	46	18	73%
03	61	8.5%	25	39	41.5%	47	17	74.5%
04	60	10%	26	38	43%	48	16	76%
05	59	11.5%	27	37	44.5%	49	15	77.5%
06	58	13%	28	36	46%	50	14	79%
07	57	14.5%	29	35	47.5%	51	13	80.5%
08	56	16%	30	34	49%	52	12	82%
09	55	17.5%	31	33	50.5%	53	11	83.5%
10	54	19%	32	32	52%	54	10	85%
11	53	20.5%	33	31	53.5%	55	9	86.5%
12	52	22%	34	30	55%	56	8	88%
13	51	23.5%	35	29	56.5%	57	7	89.5%
14	50	25%	36	28	58%	58	6	91%
15	49	26.5%	37	27	59.5%	59	5	92.5%
16	48	28%	38	26	61%	60	4	94%
17	47	29.5%	39	25	62.5%	61	3	95.5%
18	46	31%	40	24	64%	62	2	97%
19	45	32.5%	41	23	65.5%	63	1	98.5%
20	44	34%	42	22	67%	64	0	100%
21	43	35.5%	43	21	68.5%			
22	42	37%	44	20	70%			

Figure 6-17— Audio volume adjustment settings

Special Characters

The HTML language reserves certain characters for specific functions. The switcher will not accept these characters as part of preset names, the switcher's name, passwords, or locally created file names.

The switcher rejects the following characters:
{space} ~ @ = ‘ [ ] { } < > ’ “ semicolon (;) colon (:) | \ and ?.

Appendix A

Reference Information

Specifications

Part Numbers

Video

Routing	(3) 4 x 2 matrix switchers
Gain	Unity
Bandwidth	
RGB signals	350 MHz (-3 dB)
S-video or composite video signals	150 MHz (-3 dB)
Differential phase error	1.0º at 3.58 MHz and 4.43 MHz
Differential gain error	1.0% at 3.58 MHz and 4.43 MHz
Crosstalk (RGB signals)	<-50 dB @ 10 MHz, <-30 dB @ 100 MHz
Switching speed	
RGB signals' sync	<5 ms (max.)
RGB, S-video, composite video	100 ms

Video input

Number/signal type	
RGB/VGA inputs	4 VGA–UXGA RGBHV, RGBS, RGsB, RsGsBs
S-video inputs	4 S-video
Composite video inputs	4 composite video
Connectors	
RGB/VGA inputs	4 female 15-pin HD
S-video inputs	4 female 4-pin mini DIN
Composite video inputs	4 female BNC
Nominal level	1 Vp-p for Y of component video and S-video, and for composite video 0.7 Vp-p for RGB 0.3 Vp-p for R-Y and B-Y of component video, and for C of S-video
Minimum/maximum levels	
RGB/VGA inputs	Analog: 0.3 V to 1.5 Vp-p with no offset
S-video inputs	Analog: 0.5 V to 2.0 Vp-p with no offset
Composite video inputs	Analog: 0.5 V to 2.0 Vp-p with no offset
Impedance	75 ohms
Horizontal frequency	15 kHz to 145 kHz
Vertical frequency	30 Hz to 170 Hz
Return loss	
RGB/VGA inputs	<-40 dB @ 5 MHz
S-video inputs	<-30 dB @ 5 MHz
Composite video inputs	<-30 dB @ 5 MHz

Video output

Number/signal type	
Number/signal type	
RGB/VGA outputs	2 VGA–UXGA RGBHV, RGBS, RGsB, RsGsBs
S-video outputs	2 S-video
Composite video outputs	2 composite video
Connectors	
RGB/VGA outputs	2 female 15-pin HD
S-video outputs	2 female 4-pin mini DIN
Composite video outputs	2 female BNC

Nominal level	1 Vp-p for Y of component video and S-video, and for composite video 0.7 Vp-p for RGB 0.3 Vp-p for R-Y and B-Y of component video, and for C of S-video
Minimum/maximum levels	
RGB/VGA outputs	0.3 V to 1.5 Vp-p
S-video outputs	0.4 V to 2.0 Vp-p
Composite video outputs	0.4 V to 2.0 Vp-p
Impedance	75 ohms
Return loss	-40 dB @ 5 MHz
RGB/VGA inputs	<-40 dB @ 5 MHz
S-video inputs	<-30 dB @ 5 MHz
Composite video inputs	<-30 dB @ 5 MHz
DC offset	
RGB/VGA outputs	±5 mV with input at 0 offset
S-video outputs	1.5 V with input at 0 offset
Composite video outputs	1.5 V with input at 0 offset
Switching type (S-video and/or composite video)	Vertical interval

Sync

Input type (RGB/VGA group)	RGBHV, RGBS, RGsB, RsGsBs
Output type (RGB/VGA group)	RGBHV, RGBS, RGsB, RsGsBs (follows input)
Standards	NTSC 3.58, NTSC 4.43, PAL, SECAM
Input level	1.9 V to 5.0 Vp-p
Output level	TTL: 5.0 Vp-p, unterminated
Input impedance	510 ohms
Output impedance	75 ohms
Max input voltage	5.0 Vp-p
Max. propagation delay	30 ns
Max. rise/fall time	4.2 ns
Polarity	Positive or negative (follows input)

Audio

Routing	12 x 2 stereo matrix switcher
Gain	Unbalanced output: -6 dB; balanced output 0 dB
Frequency response	20 Hz to 20 kHz, ±0.05 dB
THD + Noise	0.03% @ 1 kHz, 0.3% @ 20 kHz at nominal level
S/N	>90 dB, output 21 dBu, balanced, at maximum output (unweighted)
Crosstalk	<-120 dB @ 1 kHz, fully loaded
Stereo channel separation	>80 dB @ 1 kHz
CMRR	>75 dB @ 20 Hz to 20 kHz
Volume range	-98 dB to 0 dB (volume numbers 0 to 64 in 1.0 dB steps)

NOTE *Full attenuation is volume level 0, -98 dB. The default for output 1 is -15 dB, volume level 50.*

Audio input

Number/signal type	12 stereo, balanced/unbalanced
Connectors	(12) 3.5 mm captive screw connectors, 5 pole
Impedance	>25k ohms unbalanced, 50k ohms balanced, DC coupled
Nominal level	-10 dBV (316 mVrms)

Maximum level	+20 dBu, (balanced or unbalanced) at 1%THD+N
Input gain adjustment	–18 dB to +24 dB, adjustable per input

NOTE *0 dBu = 0.775 Vrms, 0 dBV = 1 Vrms, 0 dBV ≈ 2 dBu*

Audio output

Number/signal type	2 stereo, balanced/unbalanced
Connectors	(2) 3.5 mm captive screw connectors, 5 pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	±0.1 dB channel to channel
Maximum level (Hi-Z)	>+20 dBu, balanced or unbalanced at 1% THD+N

Control/remote — switcher

Serial control port	RS-232, 9-pin female D connector
Baud rate and protocol	9600 baud (default), 8 data bits, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND
Ethernet control port	1 RJ-45 female connector
Ethernet data rate	10/100Base-T, half/full duplex with autodetect
Ethernet protocol	ARP, DHCP, ICMP (ping), TCP/IP, Telnet, HTTP
Program control	Extron's control/configuration program for Windows® Extron's Simple Instruction Set (SIS™) Microsoft® Internet Explorer, Netscape® Navigator®, Telnet

General

Power	100 VAC to 240 VAC, 50/60 Hz, 15 watts, internal, autoswitchable
Temperature/humidity	Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, noncondensing Operating +32° to +122°F (0° to +50°C) / 10% to 90%, noncondensing
Rack mount	Yes, with included brackets, part #70-077-03 Also furniture mountable with optional Under-Desk Mounting Kit, part #70-222-01
Enclosure type	Metal
Enclosure dimensions	1.75" H x 17.4" W x 8.5" D (1U high, full rack wide) 4.4 cm H x 44.2 cm W x 21.6 cm D (Depth excludes connectors and knob. Width excludes rack ears.)
Product weight	7.0 lbs (3.2 kg)
Shipping weight	10 lbs (5 kg)
DIM weight	
International	11 lbs (5 kg)
Vibration	ISTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE, FCC Class A, VCCI, AS/NZS, ICES
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *All nominal levels are at ±10%*

NOTE *Specifications are subject to change without notice.*

Part Numbers

Included parts

These items are included in each order for an MPX 423:

Included parts	Replacement Part number
MPX 423 IP	60-683-01
Rack/desk mounting brackets	70-077-03
Tweeker (small screwdriver)	
IEC power cord	
MPX 423 IP User's Manual	
Windows-based control program	
Rubber feet (self-adhesive) (4)	
3.5 mm captive screw connectors	10-319-10

Optional accessories

Part	Part number
RCA-to-BNC adapter	10-264-01
SVHS-BNC adapter	26-353-01
SY VGA-RGBHVM cable	26-533-02
Under-desk mounting bracket	70-222-01

Cables

When using signals with a scanning frequency of 15-125 kHz and running distances of 100 feet or more, use high resolution BNC cables to achieve maximum performance.

Bulk cable

Extron Part Super High Resolution Cable	Part number
RG6/SHR-1 bulk , 500'	22-098-02
RG6/SHR-1 bulk , 1000'	22-098-03
RG6/SHR-4 bulk , 500'	22-099-02
RG6/SHR-5 bulk , 500'	22-100-02
SHR male crimp connectors, qty. 50	100-075-51
BNC-4 Mini HR Cable	
BNC-4 Mini HR bulk, 500'	22-032-02
BNC-4 Mini HR bulk, 1000'	22-032-03
BNC-5 Mini HR Cable	
BNC-5 Mini HR bulk, 500'	22-020-02
BNC-5 Mini HR bulk, 1000'	22-020-03

Plenum BNC-5 Mini HR Cable	
Plenum BNC-5 Mini HR bulk, 500'	22-103-02
Plenum BNC-5 Mini HR bulk, 1000'	22-103-03

Assorted connectors

BNC connectors	
BNC Mini HR crimp connectors, qty. 50	100-074-51
SHR male crimp connectors, qty. 50	100-075-51
BNC bulkhead connectors, qty. 50 (for custom wall plates)	100-076-51

Pre-cut cables

BNC-4 Mini HR cable is used for RGBS cable runs, and BNC-5 Mini HR cable is used for RGBHV cable runs. Either type can also be used for composite video, S-video, or RGsB. All Extron BNC cables have male connectors on both ends. A plenum version of the BNC-5 Mini HR cable is also available.

BNC-4 Mini HR Cable	
BNC-4-25' MHR (25 feet/7.5 meters)	26-210-04
BNC-4-50' MHR (50 feet/15.0 meters)	26-210-05
BNC-4-75' MHR (75 feet/23.0 meters)	26-210-06
BNC-4-100' MHR (100 feet/30.0 meters)	26-210-07
BNC-4-150' MHR (150 feet/45.0 meters)	26-210-08
BNC-4-200' MHR (200 feet/60.0 meters)	26-210-09
BNC-4-250' MHR (250 feet/75.0 meters)	26-210-54
BNC-4-300' MHR (300 feet/90.0 meters)	26-210-53

BNC-5 Mini HR Cable	
BNC-5-25' MHR (25 feet/7.5 meters)	26-260-03
BNC-5-50' MHR (50 feet/15.0 meters)	26-260-04
BNC-5-75' MHR (75 feet/23.0 meters)	26-260-16
BNC-5-100' MHR (100 feet/30.0 meters)	26-260-05
BNC-5-150' MHR (150 feet/45.0 meters)	26-260-12
BNC-5-200' MHR (200 feet/60.0 meters)	26-260-06
BNC-5-250' MHR (250 feet/75.0 meters)	26-260-18
BNC-5-300' MHR (300 feet/90.0 meters)	26-260-14

NOTE *Rolls of bulk cable in lengths up to 5000' (1524 meter) are available with or without connectors.*

FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805, USA

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

Japan:

Extron Electronics, Japan
Daisan DMJ Bldg. 6F,
3-9-1 Kudan Minami
Chiyoda-ku, Tokyo 102-0074
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

PRELIMINARY

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